Introduction

The November 1997 issue of *Operative Techniques in Cardiac and Thoracic Surgery: A Comparative Atlas* is inspired by the recent surge of interest in the pulmonary autograft operation. Although this procedure has been applied clinically for over 30 years by Mr Donald Ross, it has only recently gained popularity outside of London. Interest has expanded exponentially. The procedure has been particularly embraced by pediatric surgeons in their search for a valve replacement option with growth potential. Its use is advocated for adults of all ages with a variety of valve and aortic-root pathologies. Whereas proponents contend that the pulmonary autograft will prove to be the definitive tissue valve replacement option, detractors are quick to point out that the operation converts single-valve disease to double-valve disease with an, as yet, uncertain risk of reoperation. The only truly long-term follow-up information currently available is Mr Ross's own personal series.

Before exploring the pulmonary autograft operation, we felt it was important to open this issue with several contributions describing the implantation of the aortic homograft. Not only is this procedure the historical predecessor to the pulmonary autograft, it remains an excellent surgical option today and represents a reasonable alternative to the autograft in many cases. The aortic homograft shares many of the advantages of the autograft procedure, namely, few instances of thromboembolism, a remarkable resistance to endocarditis even when inserted in an actively infected field, and nearly equivalent hemodynamics to that of the native valve. Additionally, homografts offer excellent durability. As such, they should be considered the "gold standard" against which other procedures, such as the pulmonary autograft, are measured. Despite these characteristics, the aortic homograft has not gained wide-spread application in the U.S. In part, this may be because of the perceived technical difficulty of the homograft operations. It is our goal to alter this perception through the first three articles.

In addition, a few general comments should be made concerning terminology. The term *homograft* is commonly used in the cardiac surgical literature in reference to valves obtained from cadaveric donors. As tissue is obtained from an individual of the same species but of different genetic make-up, the proper term from an immunologist's standpoint is *allograft*. More difficult language issues surround the specific technical modes of implantation. The original technique for homograft valve implantation, as described independently by Ross and Mr Barratt-Boyes was the "free-hand" or "subcoronary" technique, in which the sinuses of the cadaveric valve were excised or "scalloped." The polar-opposite technique is the "free-standing" root replacement, in which coronary buttons are fashioned and sewn to the cylindrical allograft root after proximal anastomosis to the recipient ventriculoaortic junction. Intermediate to these is the "inclusion root" or "intraluminal cylinder" technique, whereby the wall of the native aorta is preserved and the allograft root is implanted as a unit within the native structures in a manner analogous to the classic Bentall root replacement. Unfortunately, there is little uniformity in the use of these terms, particularly as applied to the latter technique. We advocate the use of the most descriptive terminology, thus, rejecting terms such as "mini-root" and the like because of the confusion that may ensue.

We are fortunate in this issue to have excellent descriptions of a variety of techniques for homograft and autograft implantation. Our first contribution concerning the homograft procedures is from Drs David C. McGiffen and James K. Kirklin at the University of Alabama, an institution long interested in the use of aortic homografts. They describe both the subcoronary techniques originally described by Ross and Barratt-Boyes, as well as the intraluminal cylinder technique for homograft insertion. They also include a scholarly discussion of the mechanisms of the failure of homograft valves. Next, Dr Richard A. Hopkins describes his technique for insertion of the homograft valve as a free-standing root replacement and his technique for annular enlargement. Our final contribution on the homograft valve is from Dr Robert B. Karp describing his technique for the intraluminal cylinder or inclusion root.

We begin our section on the pulmonary autograft with a clear and stepwise description of the Ross procedure by Dr James Oury, who has been a strong advocate of this procedure for adults, and Dr. Matt Maxwell. This is followed by a contribution from Drs Gösta Pettersson, Frederic Joyce, and Jens Tingleff on techniques for the application of the pulmonary autograft in circumstances of infective endocarditis. We conclude this issue with contributions from Dr Willem Daenen and associates, and Dr Ronald C. Elkins, delineating their approaches to the pulmonary autograft in the setting of difficult aortic root anatomy with the aim of permitting wider application of this procedure. Dr Daenen's technique of enlargement annulo-

plasty and extended aortic root replacement with the pulmonary autograft is applicable to patients with subaortic stenosis of the tunnel type, as well as for those who have outgrown previous aortic prostheses. Dr Elkins addresses the converse problem with tailoring the aortic annulus in circumstances of annular dilatation.

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